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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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FREE IMPORTATIONS.

The following goods are to be admitted free during the navigation season 1898 to 1903, at the mouths of the rivers Obi and Yenisei, in Siberia:

(a) Salt, coal, agricultural implements and machines with spare parts and appurtenances, without limitations as to nature, number and weight.

(b) Machines with spare parts and appurtenances destined for use in Siberia in factories, works, and mechanical work shops of every description, with the exception of machines and parts of the same required for steamers.

(c) Fishing nets and yarn.

(d) Cyanide of potassium and chloride of lime.

(e) Tin plate, tin, and olive oil; but only in quantities required by special fish-preserving enterprises.

(f) Bags of all kinds for the exportation of grain at the mouths of the above-mentioned rivers, but within the limit of such exportation.

All of the above articles, with the exception of those mentioned under (a), are destined for use exclusively in Siberia, and if brought into European Russia are subject to the general tariff.

REVIVAL OF THE SHIPBUILDING INDUSTRY.

The battles of Manila and Santiago have demonstrated that American-built ships are the best in the world. American armor plate has proven to be the highest grade made, and American guns have shown their effectiveness in an unmistakable manner.

Russia has already recognized this fact, and has placed large orders with the Cramps. Japan now has two cruisers building in American shipyards and is congratulating herself therefor.

The demands which our own navy will make on our shipyards and foundries will be considerable. With Russia and Japan customers of American shipbuilders, the minor nations may be expected to follow their example when they go into the markets for warships. And it may be expected that the construction of merchant ships will also take on larger proportions. What our shipbuilders are capable of doing in that line is shown by the splendid vessels, the St. Paul and St. Louis, of the American Line, built in this country, and now serving as auxiliary cruisers.

There is good reasons to believe, in fact it is apparent, that the shipbuilding industry of this country will soon assume the importance it had in the days before iron and steel replaced wood in naval construction. It is inevitable that our own demands will give this industry a great impetus, but should other countries come here for their ships, as now seems probable, it will assume great proportions.

It is only a question of a short time when the United States becomes the undisputed leader in the industries in which iron and steel are the main factors. Our natural resources and manufacturing genius make it inevitable.

REPORT OF FREIGHT AND PASSENGER TRAFFIC

TO AND FROM LAKE SUPERIOR FOR THE MONTH OF OCTOBER, 1898, INCLUDING STATISTICS OF THE UNITED STATES AND CANADIAN CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO.

EAST BOUND.

ITEMS.	US CANAL	CANAD'N CANAL	TOTAL
Copper, net tons	16,996	246	17,242
Grain, bushels	4,503,828	82,107	4,585,935
Building Stone, net tons	.....	.....	.....
Flour, barrels	1,496,909	75,250	1,572,159
Iron ore, net tons	1,253,898	146,063	1,399,961
Iron, Pig, net tons	6,102	.....	6,102
Lumber, M. ft. B. M	136,348	2,655	139,003
Silver Ore, net tons	.....	.....	.....
Wheat, bushels	13 200 579	1,890,166	15 090 745
Unclass'd Freight, net tons	22,782	1,696	24,478
Passengers, number	705	476	1,181

WEST BOUND.

ITEMS.	US CANAL	CANAD'N CANAL	TOTAL
Coal, (hard) net tons	80,166	5,200	85,366
Coal, (soft) net tons	261,809	38,115	299,924
Flour, barrels	.....	.....	.....
Grain, bushels	900	6,000	6,900
Manufactured Iron, net tons	22,977	.....	22,977
Salt, barrels	29,926	.....	29,926
Unclass'd Freight, net tons	54,570	4,846	59,416
Passengers, number	497	423	920

East Bound Freight, net tons	2,405,217
West Bound Freight, net tons	471,976
Total	2,877,193
Total Craft, United States	1,974
Total Craft, Canadian	315
Total	2,289
Total Registered Tonnage, United States	2,385,762
Total Registered Tonnage, Canadian	262,728
Total	2,648,490

H. M. S. TERRIBLE has just completed extensive trials, during which the vessel traveled 6,000 miles and there were very few mishaps. In commenting upon the results Engineering says: "The trial certainly showed that no difficulty would be experienced in crossing the Atlantic at over 20 knots speed." While developing 25,115 I. H. P. the coal consumption was 2.11 pounds per horse-power, including all auxiliaries.

NOVEMBER STORMS AND STORM TRACKS.

By Alfred J. Henry, Weather Bureau.

November is one of the most perilous months of the season of navigation. The winds are frequently of mid-winter violence and the heavy snowstorms that sometimes accompany them make navigation exceedingly difficult. As compared with October, the number of severe storms is greater; northwesterly gales continue for a longer time, and the weather is more likely to be overcast and threatening.

One hundred and sixty-six storms of greater or less severity (an aveaage of 8 per month) have passed across the lake region dnring the last 20 years.

Storms that pass eastward to the north of Lake Superior give brisk to high southwesterly winds over the lakes and generally little or no precipitation. These storms are not especially dangerous to navigation. On the other hand, storms which approach from the south or southwest may cause violent gales over the lakes, accompanied by rain, turning into sleet and snow.

The dangerous storms on the Great Lakes almost invariably come from some westerly direction. The violent winds are confined to the central portion of the storm which is generally as large as the lake itself, hence there is nothing to be gained by altering the course of the ship as might be advisable on the high seas.

Notice of the approach and force of storms is given by a system of signals. In addition to the display of signal flags a telegram is sent daily to each displayman, advising him of the weather conditions, and in the case of threatening weather, of the location and expected movement of the storm center.

Masters of vessels flying the American flag, when at a port where there is no Weather Bureau office or display station, can obtain information of the expected weather conditions by telegraphing to the Weather Bureau office in Chicago or Buffalo.

SETTING BACK THE BULGE IN A BOILER.

An ingenious method has recently come into vogue with engineers, in the practice of setting back the bulge in a boiler. Briefly, an iron bucket is fitted to one end of an iron pipe, the latter extending slightly beyond the side of the pail, this end being stopped up. The pipe's diameter is between one and two inches, small holes are bored in the part of the pipe that comes within the bucket, so as to furnish a draft, and fire clay is used to line the pail with; a bellows is attached to the other end of the pipe, which is also provided with a cross bar so that the bucket may be tipped to any desired angle. After the bulged part of the boiler has been heated by this apparatus, a jack is inserted in the boiler, and by means of it the bulged part is forced back to its original position. The top of the jack is not placed against the boiler, but a thin sheet of red-hot iron is put between it and the boiler, this iron being shaped like the boiler's surface. A large plate is put under the jack, so that all the strain may not come on one part of a boiler, but may be distributed evenly. In this way any internal bulging is easily repaired.

A technical journal such as this if written by one man would be a dull and unprofitable thing. In order to make the MARINE RECORD what it should be we must publish articles from a great many different men with widely varying experience. We want every reader, no matter where he may be located, or what may be his line of work, to consider that he has a standing invitation to contribute to our columns. Don't hesitate because you have no experience in writing or for any other reason, but do the best you can with whatever you may have that you think may possibly interest other readers.

NEWS AROUND THE LAKES.

DETROIT.

Special Correspondence to The Marine Record.

The schooner D. S. Austin is going to pieces at Ludington. Her hull is badly broken up.

The wrecker Favorite has reached Grand Haven and will go to the stranded schooner Aberdeen at once.

The schooner Lillie May, which has been lying at this port for some time past, water-logged off Amherstburg on Tuesday.

The steamer John Owen will leave dry dock on Saturday. The damage she received in going aground a t Limekiln Crossing will amount to about $6,000.

The schooner Cheney Ames, which was ashore at Sand Beach, has been libeled. The steamer Garden City was also seized on a libel by the owners of the schooner Wenona, recently lost on Lake Superior.

Harbormaster O'Neil has received a letter from the Bense Fish Co., Port Clinton, asking him to look out for a 35 foot sailboat which parted her moorings recently and is adrift near the mouth of Detroit river.

Capt. James Davidson has just laid the keel of the second large wooden schooner to be built at his West Bay City yard this winter. They will be sister boats, 336 feet over all, 327 feet keel, 45½ feet beam and 22 feet deep. He contemplates building a steamer also this winter.

Postmaster Dickerson says special delivery stamps are frequently used on letters addressed to Canada and other foreign countries. As these stamps do not effect immediate delivery at any postoffice outside of the United States, Uncle Sam receives more than his just dues.

The schooner N. C. West has just been sunk in St. Clair river below Southeast bend by the steamer Sacramento. Both boats were bound down, The schooner's bow is cut completely off and she sank immediately. The Sacramento proceeded and passed here all well after the collision with the schooner.

The lighthouse on the end of the south pier at Ludington has been moved back fifty feet because it was believed that the structure interfered with the sound of the fog whistle reaching far out into the lake. The whistle, with its hood, has been moved farther out towards the end of the pier and connected with the boiler by seventy-five feet of pipe. Under the new arrangement the whistle is more effective in carrying sound out on the water and is less of a nuisance to the public.

The bodies of Amelia and Victoria Hooper, who were drowned with three others in Lake Erie Sunday, washed ashore and were found in a marsh near Point Pelee. Walter Carr, the mail carrier who started across the channel Sunday just ahead of the sailboat carrying the ill-fated party, said that when he last saw the sailboat it was within three miles of the island. It was then on the crest of an enormous wave. A moment later it had disappeared as completely as if swallowed up in the lake. The town of Kingsville is in mourning over the sad affair.

A case arising here, and of great interest to importers, has just been decided by the Treasury Department. Customs officers seized a box car with a consignment of steel rails, agricultural implements and scrap iron because the agricultural implements had been undervalued 50 per cent. The law says all the articles in a package in which improperly invoiced merchandise is contained shall also be forfeited, and the question arose whether the box car should be considered a package. The department rules that although the goods were invoiced together and shipped in the same car, yet, as the contents were not put up in a commercial package of any kind, the rails and scrap iron are exempt from forfeiture.

At the time of the sale of the property of the Sulphite Fiber Transportation Co., the steamer A. G. Lindsay was bid in by the Peninsular Savings Bank, one of the creditors, for $31,000. A few days ago she was sold by the bank to C. R. Jones, and others, of Cleveland, for about that amount. She was built about nine years ago, costing her original owners $90,000. A few weeks ago the bank chartered the Lindsay to the Atlantic Transportation Co. and an attempt was made to lighten her up to the seven-foot mark so as to get her through over the St. Lawrence Rapids. Though $2,500 was spent on this work she could not be brought to the mark and the idea of sending her to the coast was given up, and the bank cast about for a buyer, with the above result. The Lindsay is an excellent boat, being built here by the Dry Dock Co. of the best material that could be put into a vessel.

BUFFALO.

Special Correspondence to The Marine Record.

The steamer German of the Menominee line struck the bar at the mouth of the harbor on Tuesday and was released by a tug.

The steamer Manistique, while coming up Niagara river, light, with the barge Connelly Bros. in tow, struck the rock at Bird Island pier. She was released without damage and proceeded on her voyage.

There is a little better supply of coal, but hardly enough to go around. Rates are 40 cents to Lake Michigan, 50 to Toledo, and 20 to Duluth. Canal rates are 2⅝ cents on corn to New York, with a hardening freight market.

CHICAGO.

Special Correspondence to The Marine Record.

The body of Lawrence Goss, steward of the L. R. Doty was found at Fenville, Mich., on the 7th inst.

Grain freights are quoted at 2¼ cents on corn to Lake Erie, and 2 cents to Port Huron and Georgian Bay.

A new boiler has been placed on the Independent Tug Line's floating dry dock. It was lifted into position by the line's new wrecking derrick.

Tuesday the I. T. Line tug Prodigy arrived with the schooners Ford River, Parana, Minnie Slauson, Maggie Dall and Grace M. Filer from Sturgeon Bay canal.

The I. T. Line tug Welcome arrived Sunday morning from Two Rivers, Wis., with the schooners City of Chicago, Bertha Darnes, Penobscot, Richard Mott and Bertie Calkins.

At the Chicago Ship Building Co.'s, the steamers Cumberland and Norwalk were in dock for bottom repairs and calking, the steamers Lindsay, Onoko and Majestic received some repairs.

The schooner D. S. Austin went on the beach a quarter of mile north of the piers at Ludington, Mich., on Monday and will probably become a total loss. She is loaded with bulk salt for Joys & Morton, Chicago.

William McGregor, one of the oldest boilermakers in Chicago, died October 31. Mr. McGregor was born in Scotland in 1826 and came to Chicago in 1867. In 1875 he began the manufacture of steam boilers, and at the time of his death was president of the firm of William McGregor & Co. A widow and three children, Douglas T. and William G. McGregor and Mrs. Charles D. Williams, survive him.

The schooner Minnehaha was wrecked off Sheboygan, Wis., Monday afternoon and is going to pieces on the beach. The Sheboygan life savings crew went to her assistance and took off Captain Morback and the crew of three. The schooner was bound from Hedgehog Harbor to Milwaukee with 60 cords of wood. She lost her foresail and foretopsail in the gale during the night and became unmanageable.

The Aberdeen which left Grand Haven Monday in tow of the steamer Nyack parted her tow line and went on the beach and may become a total loss. The crew got ashore safely. The Aberdeen rode out the gale when the H. A. Tuttle, which was towing her, went ashore. The Aberdeen was towed into Grand Haven at that time and had been undergoing repairs. She is insured for $40,000 with Johnson & Higgins and is owned by the Nicholas Transit Company, of Cleveland.

At the shipyard here the schooner Olive Jeanette is in dock for a new stem, some new deck forward, new donkey and deck houses, some new plank on her quarter, part new rail, new mizen boom, and calking bottom. The schooner Cape Horn is in for some new plank aft and bottom calking. The steamer Lansing was in for some new plank on her bottom and top sides, some new deck beams and rail, and calking butts. The steam lighter Albert Wallace was in for some new bottom plank and calking.

The steamer Rand was towed into Grand Haven Monday afternoon by the steamer Edward Buckley. The Rand was lumber-laden bound from Ludington to St. Joseph. Monday morning when twenty miles off Grand Haven her engine became disabled by the breaking of a piston rod and she fell off into the trough of the sea. She was picked up later by the steamer Krouse, which had towed her ten miles when the tow line parted. The Edward Buckley then went to the assistance of the Rand and towed her in. The Rand lost her deckload, but suffered little damage otherwise.

The stocks of grain in Chicago elevators last Saturday evening were 1,909,000 bushels of wheat, 10,514,000 bushels of corn, 893,000 bushels of oats, 128,000 bushels of rye, and 255,000 bushels of barley. Total, 13,699,000 bushels of all kinds of grain, against 26,424,000 bushels a year ago. For the same date the Secretary of the Chicago Board of Trade states the visible supply of grain in the United States and Canada as 17,000,000 bushels of wheat, 23,797,000 bushels of corn, 5,976,000 bushels of oats, 970,000 bushels of rye, and 3,192,000 bushels of barley. These figures are larger than the corresponding ones of a week ago by 1,524,000 bushels of wheat, and smaller by 1,011,000 bushels of corn, 397,000 bushels of oats, 159,000 bushels of rye, and 75,000 bushels of barley. The visible supply of wheat for the corresponding week of a year ago increased 2,072,000 bushels.

MEETING OF THE CLEVELAND CIVIL ENGINEERS.

The regular monthly meeting of the Civil Engineers' Club, was held November 8, with Past President Ambrose Swasey, in the chair. Present, twenty-six members and thirteen visitors. Mr. Oscar Textor, member of the Cleveland Chemical Society, presented a paper, entitled: "A Review of Tests on Steel Rivets," which was illustrated by lantern views and a variety of specimen rivets which had been subjected to severe tests. The material experimented upon was Basic open hearth steel, the average chemical analysis of which, stated in percentages, is as follows: Phosphorus, .015; manganese, .46; sulphur, .033; silicon, .005; carbon, .11. The rivets were tested for tensile and shearing strength, also by nicking and bending cold, and for their behavior under the hammer, both hot and cold. Tests were also made to discover crystallization under the rivet head, if any. The results were described as being very satisfactory, and the conclusion was reached that with proper manipulation and attention to temperatures, such steel rivets are fully equal to the best wrought iron rivets and possess a superior tensile strength. An interesting discussion followed, which was participated in by a number of the members and visitors.

MANITOWOC, WIS.

Special Correspondence to The Marine Record.

Burger and Burger are building 600 feet of new dock along the river east from their dry dock, which entension will give their shipyard a river frontage of 1,100 feet.

Harbormaster J. F. Herzog expects a busy time this fall and winter. A large quantity of coal is expected to arrive, and a lage fleet to go into winter quarters to load grain for winter storage.

The lumber barge Robert C. Wente has been fixed up with new plank-shear, stanchions, stringers, and rail, new bulwarks, upper stringers, upper deck and sides, new cabin and all new upper stanchions, and recalking all over.

The Northern Grain Company have nearly completed a new elevator and have the foundation laid for an annex elevator, the two elevators to have a capacity of 1,500,000 bushels. The elevator will be ready to receive grain about December 1st.

They are also building a fishing tug to the order of Peter Sohroeder of Two Rivers, 65 feet over all, 14 feet beam and 7 feet depth of hold. Her engine is high pressure, 14 by 16, and boiler 5 by 8, allowed 100 pounds of steam. She is to be completed by January 1, 1899.

At the shipyard of H. B. & G. B. Burger a large amount of repair work is being done, the most important being the rebuilding of the passenger steamer Algomah. She is getting three new decks, all new stanchions, rail, plank-shear and stringers, and new frames under the boilers; also new cabins.

The Goodrich Transportation Company have recently built a new warehouse at their dock on the site of their coal dock and have built a new coal dock east of the new warehouse. The dimensions of their new warehouse are 186 feet long, 95 feet wide, divided into three rooms, two of which rooms are 75 feet by 95 feet each, one being steam heated. The third room, 35 feet by 75 feet, is two stories high and is for cold storage with capacity for 700 tons of ice.

The Manitowoc Steam Boiler Works are building a Scotch type boiler, 12 by 13 feet, to be allowed 140 lbs. steam pressure, for the steamer Algomah, and a Scotch type boiler with the late Conrad Harkes' patent improvements, 10 by 12 feet, for the Milwaukee Tug Line's new tug boat. The latter boiler is to be shipped to Benton Harbor this week. They have recently put two new fire boxes in the boiler of the steamer R. C. Wente. The firm have enlarged their boiler shop which is now 146 by 60 feet, and have also built themselves a new office.

At Burger and Burger's shipyard the steamer Algomah is in dock receiving a rebuild, comprising new frames and ceiling amidships, two strakes of topside planks all around, new plank shear stringers and rail, new stanchions and bulwarks all around, new main deck and entire new cabin. She is also to receive a new Scotch type boiler, 12 by 13 feet to be allowed 140 pounds steam pressure. The steamer Robert C. Wente was in dock for part new frames, all new stringers and planking between the plank shear and rail, also new rail, all new upper stanchions and stringers and new deck outside of cabin, and recalking all over. The tug Arctic was in dock and lengthened 12 feet amidships and received a thorough rebuild. The tug L. B. Johnson was on the boxes and had leaks stopped, the tug Steward Edwards for a new wheel. They are building a new tug, 65 feet long, 14 feet beam, 7 feet hold.

CLEVELAND.

Special Correspondence to The Marine Record.

On Wednesday there was more coal on the market than for several days past at 40 cents to Lake Michigan and 20 cents to Lake Superior, but there are five vessels for coal to every cargo of ore.

The steel steamer Clarence A. Black, built at the Lorain yards of the Cleveland Ship Building Co., and registering from Cleveland, O., has been given a gross register tonnage of 4,521 and a net tonnage of 3,474. Her official number is 127,300. Other local vessels are of small tonnage this week.

The sailor who fell from a gang plank while going aboard the steamer Andaste on Wednesday morning and was drowned was James McCarthy, of Ashtabula. McCarthy's body was recovered soon after the accident by companions. It was taken to Hogan & Sharer's undertaking rooms, and thence to the county morgue.

Willard Fuller has accepted the position of blast furnace superintendent at the Lorain Steel Co.'s plant at Lorain, O., and will enter upon his new duties December 1, though the furnaces will not be put in blast until April 1. Mr. Fuller has been for a number of years the manager of the Union Rolling Mill Co.'s Emma furnace, at Newburg. He will be succeeded by Frank E. Hall, now chemist of the Union Rolling Mill Co.

The Minnesota railroads have planned to ship 290,000 tons of ore in November—195,000 tons from the Two Harbors' docks, 75,000 tons from Duluth, and 20,000 from Superior. If these amounts are shipped, the total from the three ports for the season will be 5,787,000 tons, as compared with 5,569-163 tons in 1897—an increase of about 218,000 tons. Had labor been more plentiful on Minnesota ranges, at least 300,000 tons more would have been brought down. The shipments from Two Harbors to November 1, were 2,456,332 tons, against 2,428,924 tons to November 1, 1897; from Duluth, about 2,500,000 tons; from Superior, 540,000 tons. From Ashland, the season's shipments to November 1 have been 2,257,785 tons.

FLOTSAM, JETSAM AND LAGAN.

Word comes from Port Colborne that the easterly gale lowered the water in the canal so that the steamers James and Monteagle fetched up on the bottom between the piers.

The United States Supreme Court has delivered an important judgment, the effect of which is to declare the Joint Railway Traffic Association a body illegally constituted in direct violation of the laws against trust corporations.

Two cabin doors which have been identified as belonging to the steamer Chicora, have been found by the life-saving crew at Macatawa Park, Lake Michigan. It is now thought that the vessel may have been wrecked near that place.

The Manhattan Transportation Co., of New York, which chartered the steamers H. E. Runnels and Lloyd S. Porter, is notifying lake vesselowners who have vessels for charter that no further proposals for chartering will be entertained this year.

The Inland Engineer, of St. Louis, Mo., is an illustrated monthly that does not often find its way into the office of marine newspapers, but it is none the less an interesting publication, as our sample copy would indidate. Come again, please.

A 1,700 ton steamer now building on the Clyde has just been sold to Norway for £16,500, and another ship of the same size on the stocks of the same builders is now negotiating at a similar price. Both vessels will be put under the Norwegian flag.

The wreckers will abandon the schooner Hector, ashore near Wellington. The schooner Kildonan, which went on at the same time, has been released and was towed to Kingston. The wreckers were driven away from the Hector by bad weather. She is valued at $8,000 and is not insured.

Ore shipments from Ashland to November 1 amounted to 2,257,785 tons. This exceeds the shipments of ore from that port for any season with the exception of 1895, when the aggregate was 2,350,222 tons. It is expected that this record will be made and gained this year over every other if the season is of average length.

South Haven reports that the body of a second victim of the lost steamer L. R. Doty came ashore on Tuesday, half a mile from Glen pier. The man was well dressed, about 45 years old, with black or dark hair and beard, partially bald, and wearing a life-preserver marked L. R. Doty. No other marks of identification were found.

Wannan's Marine Engineer's Guide to Board of Trade Examinations, is the title of a new work by E. I. Wannan, M. E. This hand book has been compiled exclusively for the use of engineers preparing for examinations for certificates of competency, and closely follows the routine of work set for such examinations. The book may be ordered through Bradley & Howell, 7 Coenties Slip, New York. Price, $3.

According to the customs house books, the shipments of lumber from Duluth for the month of October amounted to 39,192,000 feet. The shipments of this commodity will be quite heavy during November, but not as large as they would be if lake freights had not taken such a strong upward turn. Many of the smaller and older lumber boats do not care to risk a trip to Duluth in November.

The wreckers stripped the schooner Austin of sails and rigging on Tuesday, and abandoned the wreck. The Austin has a wonderful record for going on the beach. Five times at least has she found the shore. Once was in Georgian Bay, once at Manitowoc, and another time at Ludington near where she now lies, and still a fifth disaster is credited to her. She has an unskilled or certainly unlucky master to say the least.

Capt. Charles Carland, keeper of the Milwaukee life-saving station, speaks in very high terms of the Silbar pneumatic rubber suits manufactured by the Lion Tailoring Co., Milwaukee. Capt. Carland says that one of the coats, fully inflated, is capable of floating three men and he has tested them under all circumstances, finding them perfect in every way, and he is at liberty to say that they are superior to anything on the market and will give a more detailed experience to any one writing to him for information about their qualities.

Armour plate, manufactured by the Krupp process, was given its first test on Tuesday by the Bethlehem Iron Company at its proving ground. Many notable engineers witnessed it, besides the Russian ordnance engineers, who came from Philadelphia. It was the first test of Krupp armor of American make and was a great success. Three shots were fired from an 8-inch gun, the projectiles weighing 253 pounds and the velocity ranging from 1,600 to 1,800 feet per second. The plate was not cracked. The Bethlehem company has received a big order for this make of plates from Russia.

To be homeless, in the fullest sense, is the inevitable condition and the sore temptation of the seaman in every port, save, possibly, in some one where a relative or friend may reside. In this one fact is summed up the trials and dangers which most distinctly separate him from other members of society. Of the latter, even those who, arriving as strangers, do not form family ties in the city of their adoption, nevertheless gradually gather round them, as time passes, affections or friendships which, in part at least, take the place of the family fireside and influence existence happily. The shortness of the seaman's stay, the uncertainty of his return to the same spot, preclude the possibility of a like issue to him. He arrives a wanderer, flits for a few days through the streets, and then, again a wanderer, he departs. —New York Marine Journal.

The fortune of a Crœsus lies buried under the sands and rocks near Gunwalloe, in the Lizard district of Cornwall. In 1574 a Spanish ship, bearing a freight of $17,000,000 and many bars of gold to London for safe custody that could not be found in Spain, was wrecked amid the sands and rocks some distance from the shore—a cruel, murderous looking shore, says the London Outlook. This more than a fortune has been buried since. A part of the treasure was once secured by an enterprising Cornishman (the government claiming its toll), and more than one band of speculators has tried to rob the sea of its spoil and has been defeated by the great Alantic rollers and driven home out of pocket, but yet not without hope. There is some talk of making another search for this hidden wealth; but Cornishmen have been so bitten in many ventures that they may well button up their pockets.

There are still 289,668 tons of iron ore to be forwarded from the head of the lakes and Two Harbors before the close of navigation, and this amount will be shipped provided the weather in the meantime does not turn cold enough to freeze the ore so hard that it cannot be handled. The Duluth & Iron Range road desires to ship at least 194,668 tons during this month. The Duluth, Missabe & Northern wishes to ship 75,000 tons and the Eastern Minnesota dock on Allouez Bay wishes to ship 20,000 tons more during the season. If these amounts are shipped, and they will be unless the close of navigation should be uncommonly early, the aggregate increase of iron ore shipments from the head of the lakes and Two Harbors for the season over those of last season will be 227,837 tons. The total shipments for the season will be 5,787,000 tons as compared with 5,559,163 tons for 1897.

What a nice, pleasant ship for an ocean yachting cruise the French Transatlantic liner La Gascogne must be? She marked the commencement of her last round trip by a suicide at Havre amongst her second class passengers; at New York she was delayed because the French ambassador, who had booked a passage, missed his train, or something of the sort. Then she got in a fog, and out of that she bounded on to a sandbank. A little later, two sweet Greeks she had on board set to prodding one another with knives in a way those gentle "critters" have; while, as a wind-up, a sailor-passenger jumped overboard, and refused a lifebuoy thrown him because he wanted to *mourir pour la patrie*, or some such thing. Finding, however, the water wetter than he expected, and that he was also being driven towards perfidious Albion, he allowed himself to be saved. Quite a nice ship La Gascogne must be, as we said before.—Syren and Shipping, London.

DETROIT MARINE POST OFFICE.

LETTERS REMAINING ADVERTISED IN DETROIT, MICH., POST OFFICE NOVEMBER 10, 1898.

To get any of these letters, addressees or their authorized agents will apply at the general delivery window or write to the postmaster at Detroit, calling for "advertised" matter, giving the date of this list and paying one cent.

Advertised matter is previously held one week awaiting delivery. It is held two weeks before it goes to the Dead Letter Office at Washington, D. C.

Allen, Ben
Busch, Chas.
Brantford, John
Barton, Jim
Brown, Joseph W.
Brennan, Peter, sch. Verona.
Calvin, Chas., 3, str. Katahdin.
Corbin, Lewis J., str. Katahdin.
Cowling, Miss Anna
Deegan, Geo.
Dobson, James E.
Dapp, Aug.
Embury, Chas. A.
Eldred, E. P., str. Vega.
Fesher, J. B., 2, City of Bangor.
Farman, Mrs. L. D.
Fowler, Herbert, str. Toledo.
Glendon, Thos.
Glass, J. H., 2, bge. Wall.
Glass, E. H., 2, bge. Wall.
Haber, Frank, str. Columbia.
Hickey, F. W.
Houghton, Chas. L.
Jones, Edward
Jones, Albert
Ketchum, Chas. V., str. Murphy.
Krupp, Frank
Lorang, Fred. B., str. Volunteer.
Margeson, Robt.
Munro, Capt. Dan'l, sch. Oak Leaf.
Olander, V. A.
Peltier, Frank D.
Richards, Peter
Rowe, W. B.
Robinson, Capt., sch. Wadena.
Senior, W. H.
Sischo, Joe
Scott, Capt. A. B.
Troike, Will
Tucker, Byron C.
Wrighton, W. A., str. Pope.
Weber, Anthony, str. Katahdin.
Ward, Burt
Williams, Robt.

F. B. DICKERSON, P. M.

ADVERTISING ESSENTIAL TO BUSINESS LIFE.

In a paper on "Advertising in Its Up to Date Phases," George W. Hubbard, of Flint, Mich., according to The Iron Age, said to the Michigan Hardware Association: "I attack my subject with borrowed words: 'Trying to do business without advertising is like winking in the dark; you know what you are doing, but nobody else does.' Religion is a matter of faith, so is advertising. You keep the Commandments, go to church, pay your debts, and expect through decency and enterprise in right directions to receive your reward in heaven if not in Michigan. You patronize the newspapers, buy postage stamps, lick and apply them to letters and circulars, daub fences with instructions to call on you, and you are bright and ingenious in your ways of attracting public attention—but when all is done, in either religion or advertising. We dare not die without religion, and we cannot live without advertising."

LOSS OF THE ABERDEEN.

The tow barge Aberdeen, which broke away from the steamer Horace A. Tuttle, now a complete wreck at the entrance to Michigan City Harbor, and which was picked up and towed to Grand Haven in disabled condition by the steamer Nyack, now lies upon the beach at Grand Haven, a constructive total loss. A lost rudder had been replaced and other repairs made on the Aberdeen, and it was arranged that she should be towed to Buffalo by the steamer Philip Minch. The latter left Chicago Sunday evening, and the steamer Nyack undertook to tow the barge out to her. Just after leaving the Grand Haven piers the Aberdeen, deeply laden with corn, touched upon the outer bar with such force as to part the tow line, and the barge was carried ashore by the wind and sea. Immediately after striking the beach the Aberdeen swung broadside on, and there seems to be no question that she will prove a total loss. The crew of the vessel were taken ashore by the Grand Haven life savers.

The Aberdeen was owned by the Nicholas Transit Co., of Cleveland, and insured for $40,000 in Johnson & Higgins syndicate companies. She was built by Capt. James Davidson and came out in 1892. Her measurement is 994 net tons, rating A1*, and insurance valuation $46,000.

On Tuesday, the sea subsided somewhat and life savers went on board the stranded barge. The vessel has not broken in two as was feared. Her seams are open and she is full of water. There is a big hole amidships and the hatches were washed away. Considerable barley from her cargo has washed ashore. The grain cargo is valued at $2 ,000.

SAILOR TALK.

The vast amount of narrative which has of late been read regarding ships and the sea, few persons have stopped to think to what an extent the English language has been enriched by sea terms. For instance in response to the every day query, "How are you?" many will answer, 'First rate, thanks.' The latter speaker has no idea that he is perpetuating the remembrance of the old line-of-battleship First Rate. The navy in past days had six "rates" or classes of vessels. Sea proverbs are also met in daily use. For example, "The devil to pay, and no pitch hot." One never thinks why "devil" or "pay" should be mentioned. The saying originates in the mystery of calking the seams of a ship's deck. The outside seam, called by sailors the waterway seam, obtained among calkers the term of "the devil" through the difficulty of calking it; to "pay" is to run hot pitch along the calked seams. We say of a man who is going wrong. "He is on the wrong tack," sometimes in error using the word track. A vessel on the wrong tack may drive ashore, or, if in a hurricane, be engulfed in the heart of the storm.

Suppose some one "spins you a yarn." He may tell you of the unlucky fellow who is "among the breakers;" of the villian "sailing under false colors;" the heroine showing "signals of distress;" the hero striving bravely "against wind and tide," yet true to his love as the "needle to the pole;" presently the two are "wafted" by a "favoring gale" safely "into port." In politics the "ship of state" blunders on with Lord Tom Noddy "at the helm;" occasionally some high official is "thrown overboard" by his party.

Colloquially, we growl at an interrupter for "shoving in his oar;" we speak of two scoundrels as "tarred with the same brush;" we advise our friend to "go with the current," and we speak of him to others as all fair and "above board." Jack is a bit "rakish," and sometimes "half seas over;" if he does not reform he will some day fiind himself "high and dry," and "laid up" for good.

Such terms as in "good trim," a "snug berth," to "carry on" at "close quarters," to "fit out," and so on, are familiar to all. Here are the derivations of three of the last mentioned; "Rakish." In the old war days privateers, pirates and such gentry, depended upon the speed of their vessels; these had their masts "raking" or slanting; such a vessel was said to be "rakish"—that is, a fast and doubtfnl customer. "To carry on" is to keep sail set longer than a very prudent man would do; recklessness. "Close quarters." The modern meaning is well understood; the derivation is curious. "Close quarters" were strong wooden barriers stretched across the deck and used for retreat and shelter when the ship was boarded. The old slave ships were thus fitted in case of the slaves getting loose. In the old naval wars the term meant two ships in action, with their sides touching, as was often the case.—Chicago Chronicle.

THE fall storms are now approaching and the utmost skill is necessary to conduct lake tonnage in safety over the lakes.

CORRESPONDENCE.

☞We do not hold ourselves responsible in any way for the views or opinions expressed by our correspondents. It is our desire that all sides of any question affecting the interests or welfare of the lake marine should be fairly represented in THE MARINE RECORD.

AN INQUIRY.

SOUTH HAVEN, MICH., Nov. 7, 1898.

To the Editor of The Marine Record:

Capt. Joe Smith, of the barge Myrtie M. Ross, of this place, advised me to write you in regard to a body which came ashore at this point on Monday last, and upon which I held an inquest, knowing that through the columns of your paper we might get some trace of him. The body was that of a man about forty-five or fifty, weighing when alive about 160 pounds; height, 5 feet 8 inches; well dressed—nearly new suit checked cassimere of the "Happy Home" make; had on white shirt, standing collar; size of collar, 16; had name H. B. White written on collar, also on neckband of shirt; nearly new pair No. 7 shoes; brown hose; no underclothing. All that was found on his person was two pocket combs—one rubber and one white metal; also Petoskey agate about one inch long, pear shape. From the evidence of sailor men, and Capt. Matthews, of our life-saving station, he had been in the water not to exceed a week. The general opinion is that he was lost off some boat during the storm in which the Doty was supposed to have been lost.

J. WALLINGFORD.

WEATHER WORK.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU, CHICAGO, ILL., Nov. 4, 1898.

To the Editor of the Marine Record:

DEAR SIR:—In your issue of the MARINE RECORD for October 20th there appears an editorial paragraph on the "Coast Signal Service" and its work in connection with forecasting hurricanes which have their inception in the West Indies and move up the South Atlantic coast. I believe there is misapprehension on your part in regard to the matter, and I take the liberty of stating that the work of issuing warnings of hurricanes lies entirely in the hands of the Weather Bureau. The Coast Signal Service was established during the late war with Spain. It consisted of a cordon of station established along the Atlantic and Gulf coasts, the object being to report all war craft, hostile and otherwise, that passed along the seaboard. As soon as peace negotiations were started the stations referred to were abandoned by the Navy Department and most of the equipments turned over to the Light-House Service. Ever since the establishment of the Weather Bureau it has issued warnings of hurricanes, and especially during the past five years has this work been remarkably successful. During the early part of the past summer the honorable secretary of agriculture conceived the idea of placing meteorological observation stations in the West Indies and along the northern coast of South America with a view of giving our fleet and the commerce of all nations in those waters notice of the destructive hurricanes that often devastate those islands. The service was inaugurated by the Weather Bureau under the direction of the president. The terrific hurricane which wrought devastation to some of the islands of the West Indies about the middle of September last, destroying much property and many lives, was successfully forecast 24 hours in advance by means of this new service. The success of this prediction was commended not only by the press of this country, but of other nations.

The Weather Bureau is specifically designated by statute-at-large as the only government bureau authorized to issue forecasts and storm warnings.

I recite these facts briefly because I know that the MARINE RECORD has a misunderstanding in the matter, and that you desire to place the facts correctly before your readers.

Very respectfully, WILLIS L. MOORE,
Chief of Weather Bureau.

BREAKAGE OF HOISTING ROPES.

Last year, out of 37 flat and 262 round, together 299, steel-wire ropes at 107 mines in the Dortmund district of Westphalia, the comparatively small number of four broke suddenly, showing a per centage of 1.34 breakages against 1.85 in 1896, and 4.52 per cent. during the period of 26 years from 1872 to 1897. The four breakages last year occurred to only one round and three flat-steel wire ropes. In only one case out of the four breakages was there an external cause at work; too much slack given to the rope, owing to inattention by the engineman when drawing up the loaded cage off the keps; and two cases occurred while the cage was so being drawn up without, however, any unusual amount of slack being mentioned, while in the two other cases breakage occurred during the lift. Two tables, annexed to the report of the "Dortmund Oberbergamt" giving these particulars—one showing the duration and the other the total load wound by the three descriptions of ropes used, flat, ordinary round and locked coil round—show that the two former classes are in both respects far surpassed by the latter.

VISIBLE SUPPLY OF GRAIN

As compiled for The Marine Record, by George F. Stone, Secretary Chicago Board of Trade.

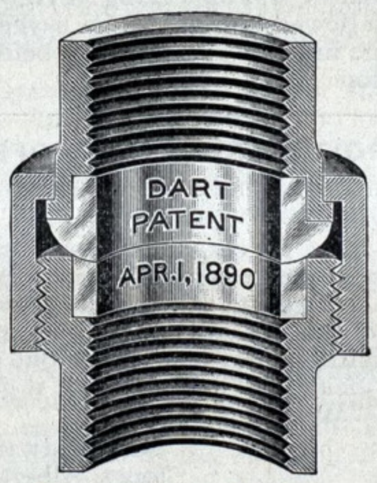
CITIES WHERE STORED,	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo	2,048,000	1,267,000	1,515,000	207,000	952,000
Chicago	1,909,000	10,514,000	893,000	123,000	255,000
Detroit	137,000	239,000	5,000	24,000	18,000
Duluth and Superior	1,637,000	1,102,000	48,000	59,000	510,000
Milwaukee	16,000	.....	.....	1,000	60,000
Montreal	174,000	212,000	388,000	28,000	7,000
Oswego	24,000	53,000	.....	.....	112,000
Toledo	261,000	165,000	117,000	19,000	.....
Toronto	42,000	.....	3,000	.....	24,000
On Canal	91,000	353,000	115,000	.....	656,000
Grand Total	17,000,000	23,797,000	5,976,000	970,000	3,192,000
Corresponding Date, 1897	29,046,000	45,103,000	15,389,000	3,818,000	4,115,000
Increase	1,524,000	.....	.....	.....	.....
Decrease	.....	1,011,000	397,000	158,000	75,000

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

UNION COUPLINGS.

[ILLUSTRATED.]

The E. M. Dart Mfg. Co., Providence, R. I., is now among the best makers of union couplings in the United States and their business is handled in Cleveland by the well known firm of the W. M. Pattison Supply Co.



The Dart Union Coupling.

The E. M. Dart Co. always keep to the fore in new improvements and in the specialty of union couplings used for steam, water, gas, oils and other liquids they endeavor to lead the United States.

The Dart patent union coupling is now considered the best device for connecting steam pipes where high pressure is carried, and performs its work under the most exacting service when sujected to the action and motion of, or incidental to marine engines and boilers. Furthermore, the company guarantee their product and manufactures as being of the best.

THE LOSS OF THE MOHEGAN.

Professor Silvanus P. Thompson writes to the London Times as follows:

"There appears to be one possible explanation of the mysterious and terrible disaster of the Mohegan. Not having seen it suggested anywhere I venture to mention it. It does not presuppose any local geological deviation of the magnetic meridian, a hypothesis which the letter of Professor Rucker in your columns today shows to be untenable. The Mohegan was almost a new boat, and the magnetism of her hull had probably not settled down to its normal conditions. I know not whether it had been found needful to readjust her compasses before she sailed on her ill-fated last voyage. It is conceivable that, in making such adjustment, the compensation had been applied in the wrong direction. This is a mishap which, if unsuspected, might easily go for a time undetected. Had, for example, an error of three degrees been found, and the adjustment misapplied, there would result an error of six degrees. How a well-navigated liner could get so much out of her course as 15 miles in going down the channel is inexplicable unless her compasses were seriously wrong."

CONSULAR REPORTS.

Consul Frankenthal writes from Berne, Sept. 14, 1898:

Since 1895, German shipbuilders have delivered 24 war vessels for other maritime powers, as follows: China, 3 armored cruisers, 5 torpedo-boat destroyers and 6 torpedo boats; Brazil, 2 torpedo-boat destroyers; Turkey, 1 torpedo-boat destroyer; Austria, 1 torpedo boat and 1 torpedo-boat destroyer; Norway, 3 torpedo boats and 1 torpedo-boat destroyer; Sweden, 1 torpedo boat.

At present there are orders to be filled for 22 vessels, divided in this manner: Brazil, 1 torpedo-boat destroyer, Japan, 8 torpedo boats, 1 torpedo-boat destroyer and 1 armored cruiser; Italy, 4 torpedo-boat destroyers; Russia, 4 torpedo-boat destroyers and three large cruisers. The value of the armored cruiser ordered by Japan is given at 13,000,000 marks ($3,094,000), and that of the three large cruisers ordered by Russia 24,000,000 marks ($5,712,000).

Vice-Consul Blom writes from Copenhagen, under the date of August 19, 1898:

The Thingvalla Steamship Co., Limited, of Copenhagen, running steamers between New York and Copenhagen, will cease to exist on October 1 next, when this line of steamers will pass over to the United States Steamship Co., Limited, of Copenhagen.

This must be considered an extremely satisfactory arrangement, as it will undoubtedly tend to increase the trade, which has already assumed comparatively large proportions between Denmark and the United States.

The following, bearing date of Sept. 9, 1898, has been received from Consul Monaghan, of Chemnitz:

At a time when so many people are talking about the importance of building a canal through some part of Central America to connect the Atlantic with the Pacific, it may be interesting to know that the Germans attach great importance to canals and waterways as factors in industrial development. Their latest effort is to cut through the territory between the Elbe and Rhine, uniting those two rivers and permitting not only of the direct passage of ships from one to the other without unloading, but allowing the Rhine boats to carry cargoes gathered in the harbors of the North Sea to places far inland. This will save freight and cost of reloading.

Consul Kehl writes from Stettin, July 11, 1898, that three Chinese steamers—the Hai Young, the Hai Chew and the Hai Shen—and one German steamer—the Hertha—have just been completed at the dock yards there. Another German steamer, the Hansa, will be ready in about three months; and a cruiser for Japan is to be finished within the next eight months. The dimensions of the several steamers are given as follows: Hertha—tonnage displacement, 5,650; length, 358 feet (about); coal capacity, normal, 500 tons; total, 942 tons, horse-power, 10,000; speed, 18½ knots; carries 34 guns and 3 torpedo tubes. Hansa—tonnage displacement, 5,900; other details same as the Hertha. The Chinese steamers have a uniform tonnage displacement of 3,000; length, 328 feet; coal capacity, normal, 220 tons; total, 530 tons; horse-power, 8,000; speed, 20.7 knots; carry 24 guns and 3 torpedo tubes. The Japanese cruiser has a displacement of 9,870 tons; length, 528 feet; coal capacity, normal, 600 tons; total 1,100 tons; horse-power, 15,500; speed, 20 knots; carries 35 guns and 5 torpedo tubes. The new Hamburg American steamer now being built is to be completed in 1900, and will exceed in dimensions the Kaiser Wilhelm der Grosse, having a displacement of 23,050 tons, a length of 662 feet, coal capacity of 5,000 tons, 33,000 horse-power, and a speed of 23 knots.

THE Manchester ship canal was designed for ships of not over 3,000 tons and drawing 22 feet of water. The steady increase in the capacity and draft of ocean steamers is now giving trouble for the canal owners, as the present channel will not accommodate even the latter class of ocean tramps. As a direct trade in cotton with American ports was one of the chief objects of the original promoters of the canal, the deficient depth of channel presents a grave problem for solution. More docks and warehouses are also needed for handling and storing the cotton; and the want of these taken with the comparatively shallow channel, are hindering the growth of the canal business. In the first half of 1898 the increase in canal revenue was about $45,000, as compared with an increase of $80,000 in the corresponding half of 1897, and $90,000 in 1896.

THE Goulds Manufacturing Co., of Seneca Falls, N. Y., have just issued a new illustrated and descriptive catalogue of their efficient power pumps for every purpose. The highest class of work is turned out by the Goulds Manufacturing Co.

CANADIAN CANALS.

A recent article by William Armour, of St. Catharines, printed in the Globe, Toronto, shows that for many years after the Welland and other of the older canals were constructed they were of great value to the carrying trade of the country, but since railways have come into general use their value is not so apparent, and it would now appear that the transportation of commerce would be as satisfactorily and more economically done if the railways were solely relied on for its accomplishment. Statistical facts show that at the present time the most unprofitable part of the country's investment to facilitate the carrying trade is that applied to the construction of canals.

The total revenue from canals for the year 1898, when the capital invested was less than $21,000,000, was $403,877. For 1896, when the capital invested had increased to over $80,000,000, the revenue was only $339,539. For the eighty millions thus invested there is no return, and, in addition to the revenue derived therefrom, there is required an expenditure of over $350,000 to keep them in operation; and while the investment and cost of maintenance is increasing from year to year the proportionate amount of freight carried is growing less, and a large percentage of the use of our principal canal is for the benefit of United States trade.

The railway and canal statistics have not been fully or satisfactorily furnished through the published governmental returns, but such as are available are sufficient to make clear the growing utility of the railways and the decreasing value of canals. For the year 1875 railways carried less than six million tons of freight; this has steadily increased until in 1896 it had reached over 24,000,000 tons.

For the year 1896 1,231,903 tons of freight passed through the Welland canal. For 1895, when the commerce of the country had about doubled, and the canal had been enlarged at over twice the original cost, the total tons of freight passed through was only 869,595, and 469,779 tons of this was United States freight passing from United States to United States ports, and probably half the remaining was United States freight consigned to Canadian ports and carried in United States vessels, for transhipment abroad. So of this amount there is not more than 200,000 tons of purely Canadian freight, such as we are interested in promoting, for its transportation.

The report goes on further to say that special stress has been laid on the value of canals for carrying grain to the seaboard, but when considered from this point of view they will not be found more valuable than that of general merchandise. For the year 1895 there were not over 150,000 tons of grain and vegetable foods of Canadian freight carried through the canals, but there were over 380,000 tons of these articles of United States freight carried through the Welland canal for that year. There were 458,000 tons of grain and vegetable foods, the products of Canada, exported during the year 1896, and the railways carried 4,342,665 tons of these goods for that year. So it is thus shown that the canals serve a very unimportant part in aiding the transportation of these staples, and in no way commensurate with their great cost to the country.

These statistical facts in favor of railways are not peculiar to Canada. In the State of New York. where conditions are very similar the carrying trade is rapidly being absorbed by the railways. For the year 1869 47 per cent. of the traffic of that State was carried through canals. This has since decreased, until in 1895 only 9 per cent. is so carried.

For the year 1896 there were over 27 million tons of freight carried by Canadian railways and canals. Of this over 24¼ million tons were carried by the railways, and about 2¾ million tons through canals. When we deduct from that passing through canals that portion which passes from United States to United States ports, and that which passes from United States to Canadian ports for transhipment abroad, and make allowances for passing through two or more of our canals and credited in our statistics in duplicate to each, it will be found that the freight passing through our canals in which Canadians are interested in providing transit will not exceed one and a half million tons.

To arrive at the yearly economic value of our Canadian canals we will require to ascertain the value to the trade and the cost to the country of this million and a half tons of freight that now passes through them. We have railway facilities to carry freight, practically, to every point which canals carry it, and it is simply a matter of convenience and economic expediency as to whether the freight is carried by rail or boat. Our government statistics do not give the cost to the shipper of the transportation of this canal freight. The freight carried by the railways costs $1.33 a ton.

But a considerable percentage of this is carried from ocean to ocean and other long distances, and probably that carried within the range of our canal traffic would not exceed $1 a ton. So we may conclude that the boats, to secure the trade, will have to carry it at a lower rate. Seventy-five cents a ton would probably be a fair approximation of what it costs for carrying this freight through the canals, thereby effecting a saving of 25 cents a ton, as against its carriage by rail, which would effect a gain to shippers for this year of about $375,000. The cost of maintenance of our canals is—allowing for interest on capital invested and excess of cost of general maintenance over revenue—over $3,500,000 a year. This amount is expended that the carrying trade of our country may be benefited to the extent of about $375,000.

This is a fair statement of the economic value of our canals for the above mentioned year.

While some approximations were necessary to arrive at this result, on account of deficiencies in government statistics, these figures are well within the mark. It is difficult to see how the result could be avoided, for if the tolls were increased the tonnage passing through, and consequently the revenue, would be more than correspondingly lessened.

While the yearly cost of maintenance greatly exceeds the revenue in each of our canals, there is much difference in the comparative value of their returns. Those more favorably situated in this respect are the Welland, Chambly, Ottawa and St. Lawrence, and among those of least comparative value are the Rideau and Trent canals.

The Rideau canal extends from Kingston to Ottawa, connecting Lake Ontario with the Ottawa river, a distance of 126½ miles. There is now connecting with it the Perch branch, six miles long. This canal was originally built by the Imperial Government for military purposes. It was begun in 1826 and finished in 1834, before any railways existed here. It was transfered to the Canadian authorities in 1857. The section of country through which it passes is now traversed by many railways, which has made it of little use, and its cost of maintenance is out of all proportion to any value it may have for transportation purposes.

For the year 1895, an average year, there were 88,753 tons of freight transported on it, and the total revenue was $7,068. The cost of maintaining this canal, not taking into consideration interest on capital invested, which amounts to about $190,000 a year, but only allowing for renewals, repairs, staff and officers of collection, amounts to $90,393. For these items of maintenance it costs our country in excess of revenue $83,325 that 88,753 tons of freight may be transported variable distances on the Rideau canal, and this freight is of a very inconsiderable value, the largest item being firewood. The freight charges on this tonnage are not given in our returns, but must be low. If this freight were carried by other available means of transportation the additional cost would certainly not exceed ten cents a ton, or in all, $9,000. So the financial result of the maintenance of this canal is that our government pays yearly $83,325 that the shippers of freight over it may be benefitted by a sum not exceeding $9,000. There can be no justification for a continuance of this expenditure.

The Trent Valley canal, under construction, is intended to make navigable for light-draught vessels, by connecting various water stretches, about 200 miles, of a very circuitous route between the mouths of the Trent river, Bay of Quinte, Lake Ontario and the Severn river, Georgian Bay. As it can only be used for local purposes, and the tract of country through which it passes is well supplied with railways, there is no reason to expect it to be a more profitable investment than the Rideau has been.

Over $1,500,000 has already been expended on construction and the results from this are anything but favorable. For the year 1895 there were 32,000 tons transported on the Trent canal, which consisted chiefly of firewood, floats and sawlogs—probably not worth more than $20,000. The revenue for this year was $1,287, and the cost of maintenance—including interest on investment, $50,000; renewals, repairs and staff, $13,930—$63,930. So the cost to the country of transporting this $20,000 worth of freight was $62,643. When the additional millions that are required to complete this work are expended the yeatly charge on our country for its maintenance will amount to a very considerable sum.

The greater part of the traffic that was intended to come through the Welland and St. Lawrence canals was from the upper lakes, but circumstances have so changed that only a small portion of this trade comes, or can be expected to come, by this route. The bulk of United States trade—for which this route is better situated than for Canadian trade—finds a shorter and more profitable way to the seaboard by being transhipped by rail from Buffalo to New York. Although Canada's policy seems to have been in great part to provide a cheap passage for this freight, for which no proper equivalent has been exacted in the way of tolls, only a comparatively small portion has gone this way.

While we should be interested in providing and improving the transportation facilities for our freight in every prudent way so that Canadian produce can reach the markets of the world at the cheapest rates, it should be our policy to conserve these facilities for the benefit of our own produce, which has to compete in the world's markets with the products of the United States, to which so much favor has been shown in the past.

The United States Deep Waterways Commission are good enough in their report to advise Canada how her canals can be enlarged to further suit the convenience of their trade, and there are some Canadians who are advocating this enlargement, which can only have the same object to serve; but the true interests of Canada do not require that a dollar of Canadian money should be expended to further the transit of the United States freight. The freight carried on the Great Lakes by the United States is probably as 20 to 1 of Canadian freight. While that country has expended $12,000,000 in improving these waterways, Canada has expended over $50,000,000.

The Canadian produce from the west for transhipment abroad, instead of coming around the lakes via the Welland and St. Lawrence canals, has taken the more direct route, by rail from Owen Sound and other northern ports, to reach the ocean vessels.

When we consider the disadvantages of distance from the Georgian Bay via lake Erie and canals to Montreal, the time required to cover the distance, with delays of lockage, etc., that it can only be used seven months in the year, and compare it with the short, quick transit by all rail available every day in the year, and by transhipment from Parry Sound and other ports, it is not surprising that the bulk of our freight from the west is being carried by this more direct route. Practically all the produce of Ontario has to be loaded on cars that are on lines of rail in direct communication with Montreal and other ports of exit, and transshipped to boats, if our waterways are to be used for its transport. This has not been found practical to any extent, and very little of Ontario's produce has been transported in this way. Even if our waterways were made to accommodate ocean vessels, these results could not be materially changed.

All the facts procurable from available statistics go to show that the construction of deep waterways to promote the carrying trade of our country can only be—under present conditions—profitably engaged in when they can be constructed in the natural trade channels without materially increasing the distance, and with a minimum of lockage.

The route from Lake Superior, which lies in the direct channel of trade for a vast amount of traffic from the west, where many hundred miles of deep waterways can be connected by a single lockage, can be turned to profitable account. But when such waterways are out of the direct channels of trade, materially increasing the distance, and when the delay and expense connected with a numerous lockage have to be taken into account, such waterways cannot be made to compete with our modern railways.

The necessity of maintaining and extending our system of canals seems to have been accepted in the past, without question, as the settled policy of our country. The transition from the time when they furnished valuable aids to our carrying trade to when several of them became a useless charge on our country was gradual; and our administrators, no doubt, hoped that these conditions might mend. However, it is unfortunate that large amounts are still being expended in this line, with no hope of profit, but with the certainty of adding further useless burdens on our country for their maintenance. But when the people become fully informed regarding the nature of these investments it will be easy for those charged with the administration of our affairs to remedy these defects.

PAUL MORAN, of the steel shipbuilding firm of Moran Bros.' Co., Seattle, Wash., died September 23, on a Yukon river steamer. He was born at Montclair, N. J.; learned the machinist trade; went to Seattle in 1878, working at his trade, and with his brothers in 1882 organized the well-known machine and shipbuilding firm, he assuming charge of the machinery department. Five of the seven brothers who formed the firm are still connected with it.

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CLEVELAND, O., NOVEMBER 10, 1898.

A MEETING of the passenger agents of the St. Paul-Duluth roads was held this week in Duluth, to consider the matter of rates for returning sailors from the head of the lakes after the close of navigation. C. E. Stone, of the St. Paul & Duluth, T. B. Lynch of the Great Northern, J. C. Poore of the Northern Pacific, and F. S. McCabe of the Omaha roads, held a meeting with the local passenger association. It was decided that a half-fare rate should be allowed.

WE have received a pamphlet reprinting from Cassier's Magazine for November a lecture delivered at Cornell Uuiversity by Walter B. Snow, of the engineering staff of the B. F. Sturtevant Co., Boston. The title is "Mechanical Draft for Steam Boilers." Among the illustrations are views of boilers equipped with Howden hot-draught for use with Sturtevant fans on the steamship St. Paul of the American line, and of a duplex Sturtevant fan for a boiler plant. The figures showing the economies of the mechanical draft are similar to calculations already presented in these columns.

THE light-house tender Haze will leave Buffalo about November 15 for the purpose of taking up the buoys in Lake Erie and the Detroit river. All buoys will be replaced with winter buoys. The spar buoy at Dunkirk, N. Y., will be left in place. The buoys at Erie, Pa., will be taken up about November 16. Those at Sandusky, O., and the islands, about November 20. Those in Maumee Bay, about November 25. Those in the Detroit river (excepting the gas buoys), about November 30. The gas bnoys and light vessels in the Detroit river will be left in position as late as circumstances will permit, probably until about December 8 or 10. The position of the Bar Point light vessel will be marked by a black spar buoy. Waverly Shoal buoy and the Niagara river buoys will be kept in position as late as the season will allow. Charity Shoal buoy and all the St. Lawrence river buoys will also be left in place as late as possible.

THE commercial organizations of New York City have resumed their struggle against the "winter load line," which is supplementing the injury done to the business interests of the metropolis by the differential rates on grain that divert a large part of the grain trade of the west to Baltimore and other southern ports. The British winter load line rule permits steamers to load deeper at Baltimore than at New York and other northern ports. The rule was established in the days of sail navigation, and was based upon the theory that vessels leaving Baltimore take a southern lane across the Atlantic and thus reduce the risk upon both vessel and cargo. The entry of steam into the carrying trade has removed the main reason for the winter rule, because steamers can choose their own course, and most of them, after leaving Baltimore, take a northerly course and run across in practically the same lane in which the New York vessels make the voyage. Therefore the insurance companies take as much risk on southern cargoes as upon cargoes taken on in New York.

THE LUMBER FIELD.

The lumbermen at the head of the lakes are beginning operations, camps are being built and large numbers of men and teams are being hired. The logs cut this winter of 1898-99 will be enormous as compared with former years. It is estimated by lumbermen that this winter's cut will exceed former years by anywhere from 100,000,000 to 150,000,000 feet. The wages that will be paid this winter for chopping is placed at about $215,000 per month, and from 2,000 to 3,000 more men will, in all probability, be employed this year in the woods about the head of the lakes than last year.

The wages paid last winter did not quite total $75,000, and men were paid per month as low as $10, whereas, at present, the wages are from $28 to $30 and upward. This is much larger than wages have been for some years in the different lines of work connected with lumber camps. Chicago, New York and the New England markets have been supplied this year, so far, from the Lake Superior region, to the enormous amount of 800,000,000 of timber, practically all of this coming from the Duluth-Superior district, Ashland, Marquette and the "Soo" districts, though the head of the lakes has supplied by far the greatest part of this supply.

The Weyerhauser syndicate is opening four mills at Cloquet, while another large one is building at Nebagamon. It is estimated that these people will cut 100,000,000 feet this winter. The lumber mills at Superior and Duluth will cut about 140,000,000 feet, while mills located on the ranges above Duluth will cut 70,000,000 feet. At Carlton and Cloquet about 75,000,000 more will be cut, and a grant total of nearly 700,000,000 feet is reached.

Nearly 8,000 men will be employed in the woods to get out these several quantities of pine, and in consequence jobbing and provision houses are busy fitting out camps with necessaries, and will be kept so during the winter. Lumbermen are feeling jubilant over the prospects this season. The total number of feet of pine that will take out this winter is placed at about 700,000,000, while the total nnmber of feet of lumber that went from Lake Superior to points in the east this year is estimated at 800,000,000.

It is reported that the McCord Lumber Company has secured a contract from the Land, Log & Lumber Company of Milwaukee, which is operating in this section of the country, for 20,000,000 feet of pine, all in the vicinity of Poplar river and Bardon creek in Douglas county. This is to be taken out in two years, the contract terms being to take from the stumps and turn into lumber, to be piled on the company's docks. The contract to log and put into the booms has been sub-let to John Colbrath, ten million to be taken each year.

H. E. Stanbury, has purchased 2,000,000 feet of pine stumpage at Poplar in the vicinity of Poplar river, and will log it this winter. The prospects are excellent and the employment of labor will be larger than it has been in five or six years. In fact the lumber outlook and the wages in Douglas county are better this year and will be this winter than ever before in the history of the whole county. This seems to be the unaminous opinion of Superior lumbermen. There will be 50,000,000 feet more of pine taken out this winter in the vicinity of Superior and Douglas county, than was ever taken out in one season before.

Mr. Ogilvie of the lumber firm of Ogilvie & Turrish, said: "The tariff of $2 imposed upon Canadian lumber has proven to be a wonderful boon to lumbermen and loggers at the head of the lakes, for it has resulted in getting eastern buyers, and it matters not what quality the lumber is, it sells because it is needed. The Canadian tariff has helped the lumber business in this part greatly and no mistake."—Evening Telegram, Superior, Wis.

THE NAVAL RESERVES.

Touching upon the Naval Reserves as they term it, the naval militia, the Milwaukee Wisconsin says: The report of Capt. Bartlett, who had charge of the auxiliary naval force during the war with Spain, commends the work done by the naval militia, and therefore endorses the policy of continuing the auxiliary branch of the United States Navy. It is probable that new battalions will be formed in the states with seaports where no naval militia now exists.

The captain's reference to an experience that was not to the liking of the naval militia and that caused protest bordering on insubordination shows a weak spot in the naval auxiliary plan. It was found that the volunteers objected to being placed on regular warships, under the command of warrant officers. There was probably good reason for this objection, as old "Jack Tars" who work into positions of command are not, as a rule, fitted to exercise the calm judgment that is required in the handling of a volunteer force which comprises patriots from the best walks of society.

The remedy for this is to use the naval volunteers on the special ships, and to place them under command of warrant officers from their own ranks. The chief commands should, of course, be given to regular officers of the United States Navy. Graduates of Annapolis are gentlemen of education who fully understand the character of the naval auxiliary and can make the most of it. The government should provide practice ships for the naval auxiliary from among the large fleet of vessels that were purchased for use as naval vessels during the war with Spain, and detail officers to drill the naval militia in sea and shore duties. The new branch of the nation's war service is important enough to warrant special effort to augument its strength and efficiency.

MILWAUKEE COAL RECEIPTS.

The total receipts of coal by the lake route in Milwaukee during the season of 1898, up to November 1, have been compiled. While they show a considerable increase as compared with the total receipts of 1897, up to the 1st of November, it is stated by leading coal dealers that the aggregate receipts for the year of 1898 will fall considerably short of those for the entire season of 1897. This difference is accounted for by the fact that on account of the great strike in the coal regions last year comparatively little coal was to be had until quite late in the season. Then every supply station was exceedingly short and rush orders were sent in for coal, and 180,574 tons of anthracite and 312,515 tons of bituminous or a total of 493,089 tons, were received in Milwaukee after November 1.

Of this amount a great quantity was disposed of to railway companies, and more than the usual amount was shipped out from Milwaukee during the winter. The same conditions do not exist this year, and instead of being short on supplies on November 1 this year, all dealers had received about their usual amounts, and comparatively little additional will be received here during the balance of the shipping season.

The total receipts of anthracite coal in Milwaukee during 1898, up to November 1, amounted to 619,938 tons, and the total of bituminous amounted to 565,013, making a grand total of 1,184,951. The total receipts of anthracite last year up to November, amounted to 460,961 tons, and 457,697 tons of bituminous, or 918,658 tons in all, or 266,293 tons less than the receipts of this year up to November 1.

LAKE FREIGHTS.

Grain freights this week from Chicago were steady, 2¼ c. on corn to Lake Erie. From Buffalo we learn that rates are steady at 40 c. to Chicago and Milwaukee, 50 c. to Portage, 60 c. to Racine, and 20 c. to Duluth. There is a scarcity of cargoes at present, but a better demand for tonnage is expected to develop.

THE accepted plans for the new battleship Maine, and her sister-ships, the Ohio and the Missouri, call for a ship approximately 12,150 tons, with a water-line length of 388 feet, beam 72 feet, and draught of 24 feet 6 inches, with full stores, supplies, and ammunition, and a guaranteed speed of 18 knots, at a cost of $2,885,000. In appearance, according to Harper's Weekly, the Maine, Ohio and Missouri, up to the top of the superstructure, and as far as the armament is concerned, are identical with the Illinois, Wisconsin and Alabama. They will carry four 18-inch breech-loading rifles, paired in eliptical turrets forward and aft; fourteen 6-inch rapid-fire guns in the broadside batteries, and twenty-four rapid-fire and machine guns in the secondary battery, mounted at various points throughout the ship. For armoring these ships the original 16½-inch Harveyized armor plating will be superseded by 10-inch Kruppized plating, which admits of a broader and longer belt for the same weight of steel.

A SPEED of 40.8 statute miles per hour is reported for the Chinese torpedo-boat destroyer Hai Lung, built by the Chichau Works at Elbing, Germany. The trials were made on a 19-knot course in the open sea and in moderately rough water. Several runs were made, the average speed being 35.2 knots, which is equivalent to 40.8 miles per hour.

The Scientific American of October 29 contained a valuable article, "Concerning Steam Boilers," by our old friend Egbert P. Watson, of Elizabeth, N. J., and late editor of the Engineer, now combined with the Scientific American of Cleveland.

THE TRANSPORTATION OF IRON ORE.

BY E. B. TAYLOR.

Paper read at the meeting of the Engineers' Society of Western Pennsylvania, Pittsburg, October 18, 1898.

The principal receiving docks of Lake Erie are those at Cleveland, Fairport, Ashtabula, Conneaut and Erie. Next in importance are those of Buffalo, Toledo, Lorain, Huron and Sandusky.

The relative importance of these ports can be readily seen by an inspection of the tables below, giving the receipts of ore for the last six years, and the storage capacity as shown by the ore on docks at the close of navigation on Dec. 1.:

IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS.

PORTS.	1897.	1896.	1895.	1894.	1893.	1892.
Toledo	416,438	301,794	260,730	158,384	145,515	139,987
Sandusky	70,792	58,667	12,361	23,043	4,464	49,736
Huron	198,231	226,515	146,442	172,775	137,775	65,000
Lorain	355,188	191,445	214,219	150,424	165,667	190,400
Cleveland	2,456,704	2,313,170	2,312,370	1,624,573	1,260,716	1,950,224
Fairport	1,008,340	941,446	914,617	976,222	792,517	866,611
Ashtabula	3,001,914	2,272,822	2,474,791	1,987,722	1,845,738	2,555,416
Conneaut	495,327	327,623	244,967	237,905	203,207	1,130
Erie	1,311,526	847,849	811,989	624,438	469,299	645,230
Buffalo and Tonawanda	797,446	545,101	719,742	395,339	308,238	197,000
Total	10,120,906	8,026,432	8,112,228	6,350,825	5,333,136	6,660,734

The opening of the Bessemer road to the Carnegie furnaces has changed the relative importance of Conneaut, making it one of the most important ports, and the receipts in 1898 will read at least 1,450,000 tons.

IRON ORE ON LAKE ERIE DOCKS DEC. 1, GROSS TONS.

PORTS.	1897.	1896.	1895.	1894.	1893.	1892.
Toledo	194,644	151,959	113,132	96,157	92,911	71,409
Sandusky	84,786	59,491	34,375	77,004	78,439	87,500
Huron	230,029	200,075	101,000	147,632	89,000	45,000
Lorain	317,509	231,288	224,264	223,732	201,632	147,600
Cleveland	1,478,355	1,419,311	1,200,792	1,441,785	1,163,930	1,347,992
Fairport	825,312	773,905	605,470	660,980	578,033	610,609
Ashtabula	1,835,694	1,441,666	1,301,302	1,439,119	1,296,431	1,312,658
Conneaut	360,895	275,800	292,460	199,365	91,337	.....
Erie	484,871	355,222	335,718	454,233	359,827	401,683
Buffalo	111,660	82,267	207,199	94,238	119,170	125,000
Total	5,923,755	4,990,984	4,415,712	4,834,245	4,070,710	4,149,451

It is unnecessary to give a detailed statement of the characteristics of these docks, the capacity for handling and storing is given in the table.

ORE DOCK CAPACITIES OF THE FIVE PRINCIPAL LAKE ERIE PORTS.

PORTS.	RAILROADS.	Aggregate dock face. Feet	MACHINES. McMyler.	Ore Bridges.	Fast Hoists.	Aggregate unloading capacity per day. Tons.	Total storage capacity including trestle. Tons.
Cleveland	Penna. Lines. Erie. C. T. & V. R.	7,200	4	46	12	25,000	1,600,000
Fairport	Pittsburgh & Western.	5,500	18	17	.....	10,000	950,000
Ashtabula	Penna. Lines. Lake Shore.	11,350	19	66	18	37,500	1,950,000
Conneaut	P. P. & L. E.	4,000	3	15	12	13,000	700,000
Erie	Penna. Lines.	4,368	6	13	12	10,000	750,000
Total	All Lines.	32,418	50	157	54	95,500	5,950,000

Cleveland has the distinction of being the first to receive the Lake Superior ore. It was the natural destination, as it was connected by rail with the Mahoning Valley, where were a few small local stacks working up black brand and local hematites on the excellent block coal that was mined in this valley. When this ore reached Cleveland, it was handled with very primitive machinery. A whiskey barrel sawed in two, with knotted ropes passed through eye holes bored on each side, formed the bucket into which the ore was shoveled. A block and fall fastened to one of the spars of the vessel, and a horse at the end of the rope was the machine that hoisted it out of the hold; a wheelbarrow, the bridge for moving it back to storage piles. Erie received its first ore from the lake Champlain district. The first ore was received in 1856, and simply thrown by hand out of the vessel's hold on to the dock and wheeled back to the storage place on the public landing at State street. But in those days of small things there was but little ore to handle, and the price of the ore was such that it could stand the cost of several handlings.

On reaching the docks there are three ways of disposing of the ore.

First. Direct loading into the cars for immediate shipment to furnaces.

Second. Unloading into stock piles on the docks.

Third. Unloading into specially designed cars for carriage to storage trestles.

In former years it was customary to store a good portion of the ore at the lake ports, shipping to the furnaces only as required for daily use, but in later years the furnaces have increased their storage facilities so as to be able to take a large portion direct fram the vessel, and this year at least two-thirds will go forward direct.

This means a considerable saving to the consumer, but requires the railroad companies to provide increased equipment to carry in seven months what they formerly carried in twelve months. It enables them, however, to do with less storage capacity, and thus saves some considerable expense for additional terminal facilities, which would have been required to handle the increased receipts.

The ore is handled by contractors for the railroad or dock companies, the railroad companies generally owning the ground and sometimes the machinery, and for the use of which a rental is charged. In other cases the machinery is furnished by the contractor.

The fast hoist is used where the ore is all to be loaded directly into cars. At Conneaut the record for rapid handling is that of August 30, 1898, when 13,247 tons were unloaded.

When the ore is to be put under storage trestles, side dump cars of large capacity (80,000 to 90,000 lbs.), with three trucks, are used, these cars being much better suited to the work than self-clearing hopper cars.

The contractor is paid both by the vessel owner and the railway or dock company, it being the duty of the vessel to deliver the ore to the railroad or dock company on the rail of the vessel, and when the ore has to be loaded from stock piles a charge in excess of rate for loading direct is made.

In loading from stock pile, the ore is sometimes shoveled direct into the cars; in other cases it is loaded into the regular ore buckets, and hoisted by the same machinery used in unloading from vessel. In other cases a bucket scoop is used and steam shovels are also employed. The margins are now so close that every possible economy has to be practiced.

The ore is carried in two types of cars, the plain gondola, with loose or fixed ends, varying in capacity from 30,000 to 80,000 lbs., and the hopper cars, of a capacity from 70,000 to 100,000 lbs. It is customary to permit a loading of 10 per cent above the marked capacity, so that on some cars 110,000 or even 115,000 lbs. of ore can be carried.

The introduction of the large capacity cars has been forced upon the rail carriers, first by the large increase in the carrying capacity of the vessels, which require the same dispatch that was given the vessel of 2,000 tons in the early nineties, and, secondly, by the reduction in compensation for carrying the ores to the furnace.

It was impossible in many cases to increase dock or track facilities, and reduced earnings made necessary reduced expenses. The first step was the building of cars to carry 77,000 to 80,000 lbs. of ore, and of the self-clearing type. These cars were shorter than the standard gondola, and as 12 of these cars, carrying 924,000 lbs. of ore, would stand on the same track as 10 gondola, carrying 660,000 lbs., we gain 40 per cent. These cars were soon followed by steel cars of 100,000 capacity, and 31 feet in length, and as these cars will carry safely 110,000 to 115,000 lbs. of ore, we have an advantage of 60 per cent. over the standard 60,000 gondola, and the furnace owner has the advantage not only of getting his ore in a self-clearing car, thus reducing the cost of labor in unloading, but he can get 40 to 60 per cent. more ore on the same track, and thus is saved the expense of increasing his track facilities to meet increase in his production of pig iron. Of course, he must increase his storage trestle to get the full benefit of the economies, and the railway company must spend more for their 100,000 cars than they did for the 60,000 capacity car, but the cost of maintenance is no greater, and the light weight not proportionately greater in comparison with increased carrying capacity.

The introduction of the large car has compelled the building of larger locomotives, and the reduction of grades. In some cases the reduction of grades has not been possible, and the only economy effected has been the introduction of large locomotives.

The improvements of the last ten years have been very marked, and ore is being handled at a cost for labor from its natural state in the ground to the furnace stack that twenty years ago would have been thought impossible. To this the ore itself has largely contributed. The extended use of steel in the Great Lake and ocean steamers, in the larger locomotives, in the ore car, in the heavier rail, in various structural materials, has been made possible by the discoveries of rich ores that can be cheaply mined, and when ore is loaded on cars at a cost of four cents per gross ton, the mining cost is down almost to the vanishing point. It is true, also, that the furnace manager has done his part in reducing cost by improved methods and better machinery, details of which will no doubt be set forth in a future paper before this society. The tendency of the times is to give the consumer cheaper and better articles, and in nothing is this more manifest than in the production of iron and steel.

HYDRAULIC RIVETER.

The Wais & Roos Punch & Shear Co., of Cincinnati, Ohio, in addition to manufacturing its regular line of punches, shears, rolls, doublers and Hackney pneumatic hammers, has become the sole manufacturer in the United States of the products of L. W. Breuer, Schumacher & Co., a German firm. This line includes hydraulic riveters, air accumulators with pumps, steam-hydraulic plate shears, billet shears and forge presses.

Their portable hydraulic riveter has a 10-feet throat, with plate holder for 100 tons pressure and rivets up to 1¼ inch in diameter. The frames are of steel; the cylinder and valves of bronze. The cylinders are so arranged that they fill themselves out of the waste pipe, and there is very little pressure water used from the accumulator, and the pump thus has but little work to do.

The machine is suspended from a traveling crane so that it can be used at any location desired. It has an adjustable balance weight so perfectly balancing the machine that the operator handles it quickly and adjusts it to the rivet, which is easier than adjusting the boiler to the riveter, pushing it into the shells from one rivet to the other, or turning it by the worm gearing for the circle seams. No tower for suspending the boilers is needed. A truck running on rails is sometimes used and the boiler moved with ratchet lever forward and backward on the track, the shells are rotated on the truck. With the accumulator set to any desired pressure, rivets may be put in any position, as fast as they can be handled, without noise, vibration or knocking. The machine is furnished in all sizes, both stationary and portable, for all pressures or any size rivets. The portable machine with boiler, pump, accumulator and crane may be supplied all mounted on a truck or car for outside work.

ENGLAND AND THE NICARAGUA CANAL.

One of the questions that will have to be discussed very frankly between the United States and England in the near future is that of the political control of the Nicaragua canal. The people of the United States have been wont to look upon the Clayton-Bulwer treaty as totally obsolete and outgrown. This view also has been in general, if we mistake not, accepted by our English friends. But there has been some disposition to assert that Mr. Clayton in the 50's had succeeded in tying the hands of the American nation through all time to come as respects an American ownership and control of the canal, which will be virtually a part of our coast line, and which we must certainly construct in the near future for naval if not commercial purposes. Joint control is not a feasible proposition. Insistence upon it by England would seriously endanger those good relations between the two great English-speaking countries that are so valuable to both and so essential to the best progress of the world's civilization. There is not the slightest thought on the part of the United States of any use or control of the Nicaragua canal that would not be thoroughly hospitable not only to England's merchant marine, but also to the British navy. The canal would certainly be open to British commerce at precisely the same rates of toll that would be charged to ships having an American register. It would be long-sighted rather than short-sighted statesmanship on the part of England to encourage in every way the American construction and control of the Nicaragua canal. English trade would benefit materially, and the political understanding between the two nations—which is already recognized by the continental powers as the most important fact in all recent international tendencies—would be greatly strengthened. England wishes our support in a general way for her positions and policies in the far east. But the value of our support in the last resort lies in our ability to use our naval strength in the Pacific. With the Nicaragua canal constructed and under our control, our naval strength as respects affairs in the Pacific would at once be more than doubled.—American Monthly Review of Reviews.

EASTERN FREIGHT REPORT.

Messrs. Funch, Edye & Co., in their weekly freight report to the RECORD state that offerings of steam tonnage having latterly been on a decidedly more liberal scale than during the preceding week, the list of fixtures shows quite an increase in numbers, without any decline in freights generally, whilst prompt open tonnage continuing scarce, a further advance could be obtained for boats in that position. Fixtures are beginning to lap over into January at from 1½ d. to 3 d. decline against December rates. Charters for later months are purely speculative, however, and rates conceded from 3 s. 3 d. to 3 s. 4½ d. from Range for picked ports. In the Gulf, some prompt cotton boats have been closed at top figures, but the demand for later tonnage has perceptibly diminished. The South Atlantic ports are still open for some November boats, but apparently indifferent to December tonnage, except at a reduction. For other trades the demand for steam tonnage is not urgent.

Our market for sail tonnage does not offer any points of particular interest, if we except the fixture of a couple of vessels for grain, one to Cork f. o., the other to Dover direct, both at 3s. 6d. per quarter. There is some slight further inquiry in this line, and with present rates for steam upheld, additional fixtures of sailers for grain seems probable. In other lines there is absolutely nothing new, the demand being very limited. There has not been a single charter for case oil to the Far East, and only one for barrel oil to Europe since our last report, whilst but few lumber charters have been effected, and for miscellaneous freights the showing is equally poor.

HUGE HOLLOW STEEL SHAFTS.

The Bethlehem Iron Co. recently completed a shaft for the 7,500 horse-power engines which are to go into the Ninety-sixth street power-station of the Metropolitan Street Railway Co., at New York. The test pieces showed an elastic limit of 35,000 pounds per square inch and an elongation of 25 per cent., the material used being fluid compressed open-hearth steel, made at the Bethlehem Works. The shafts were forged hollow on a mandrel, and are the largest forgings of this character ever produced. They measure 37 inches through the fly-wheel fit, 34 inches through the journals, and 30 inches through the crank web fit. The axial hole is 16 inches diameter, the length over all 27 feet 4 inches aud the estimated weight 70,000 pounds. A shaft of the same type is now in hand at the same works for the power station at the Boston Elevated Railway Co. This, however, is to be an even more remarkable forging than that mentioned, as the specifications have called for the highest grade of fluid compressed nickel steel, annealed and oil tempered. These requirements are the broadest ever demanded in forgings for this type of engine. The material must show an elastic limit of 50,000 pounds per square inch, and an elongation of 18 per cent. in test pieces 1 inch in diameter and 10 inches long. The actual dimensions are to be: Diameter of fly-wheel fit, 37 inches; diameter of journals, 34 inches; diameter of crank web fit, 32 inches; diameter of axial hole, 17½ inches, and length over all, 27 feet 10 inches. The estimated weight is 63,000 pounds.

"THE WIND BLOWETH WHERE IT LISTETH."

A good story is told about E. E. Roberts, the inventor of the Roberts boiler.

He was senior assistant engineer of the steam frigate Colorado when she was flagship of the second division in the two attacks on Fort Fisher during the war of the rebellion. While lying in Hampton Roads, previous to the sailing of the fleet, he noticed that the ship had a slight "list" from using more coal out of the starboard bunkers than out of the bunkers on the port side. He, therefore, decided to have a brass pendulum and quadrant made and attach it to the vessel in such a position that it could be seen by the firemen. This pendulum would show whether the vessel was on an even keel or whether she had a list, and a degree of the list would be shown. This was made by one of the machinists on board and put in position. It could be seen through the fire-room hatch and was noticed by a young deck officer who was noted for sticking his nose into the business of the engine-room department. It happened that Mr. Roberts was on watch at the time the young deck officer noticed the "improvement" and an explanation was at once demanded from Mr. Roberts. His reply was that it was an apparatus for determining the direction of the wind. The young deck officer was very much puzzled by this, but did not want to show his ignorance by asking any further questions. He, however, let the information leak out in the ward room until it came to the ears of the "first luff," who was also puzzled thereby and requested an explanation from the designer of the apparatus. The designer thereupon told him that, when he was young, he read in the Bible "that the wind bloweth where it listeth" and that the list of the ship, therefore, ought to show the direction of the wind. As orders were received a few hours afterwards for sailing of the squadron to the North Carolina coast, the matter was allowed to drop without any further action being taken.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA — NORTHERN LAKES AND RIVERS—MICHIGAN, ILLINOIS AND WISCONSIN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., Nov. 1, 1898.

LAKE MICHIGAN, GREEN BAY, ETC. BUOYAGE.—Notice is hereby given that the work of changing the iron buoys in the Ninth Light-House District, for the winter, to spar buoys, similarly painted, will begin on the dates below:

Gas-lighted buoys, entrance to Fox river, Green Bay, Wisconsin, November 7.

Gas-lighted bell and iron buoys in Green Bay, channels between Lake Michigan and Green Bay, on Wiggins Point Shoal, and in Sturgeon Bay, Wisconsin and Michigan, November 8.

Gas-lighted buoys, Fox Island and Rush Shoal buoys, Lake Michigan, Michigan, November 12.

Mackinac Straits (west of old Mackinac light station), and channels north and east of Beaver Island group, Michigan, November 15.

Off Sheboygan, Wisconsin, November 18.

Off Milwaukee and Racine, Wisconsin, November 21.

Off Chicago, Illinois, November 28.

GREEN BAY AND FOX RIVER.—Notice is hereby given that, on or about November 15, 1898, the following-named lights will be established in the southerly end of Green Bay, at the entrance to and in the mouth of the Fox river:

TAIL POINT PILE CLUSTER BEACON LIGHT.—A fixed white lantern light, 15 feet above mean lake level, on top of a small white lamp house surmounting a cluster of three piles in about 10 feet of water, on the westerly side of the channel, and about 4,800 feet ($\frac{9}{10}$ mile) S. by E. ¼ E. from Tail Point light-house.

The light will illuminate the entire horizon.

ELBOW BEACON LIGHT.—A fixed red lens-lantern light, about 12 feet above mean lake level, shown from the projecting window on the channel side of a small white lamp house surmounting a cluster of six piles in about 9 feet of water, on the easterly side of the dredged channel, at the elbow about midway between Grassy Island and the mouth of the Fox river.

The light will illuminate 180° of the horizon to the westward of S. by W. ¾ W. and N. by E. ¾ E.

MURPHY'S DOCK BEACON LIGHT.—A fixed red lantern light, about 18 feet above mean lake level, on a white post on the northerly end of Murphy's dock, easterly side of the mouth of the Fox river.

Bearings are true; miles are statute miles.

By order of the Light-House Board:

FRANCIS J. HIGGINSON,
Commodore, U. S. Navy, Chairman.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 10TH DIST.
BUFFALO, N. Y., Nov. 5, 1898.

The Light-House Tender Haze will leave Buffalo, N. Y., about November 15th for the purpose of taking up the buoys in Lake Erie and the Detroit river. All buoys will be replaced with winter buoys.

The spar-buoy at Dunkirk, N. Y., will be left in place.

The buoys at Erie, Pa., will be taken up about November 16th.

Those at Sandusky, Ohio, and the islands, about November 20th.

Those in Maumee Bay about November 25th.

Those in the Detroit river (excepting the gas buoys) about November 30th.

The gas buoys and light-vessels in the Detroit river will be left in position as late as circumstances will permit, probably until about December 8th or 10th.

The position of the Bar Point light-vessel will be marked by a black spar buoy.

Waverly Shoal buoy and the Niagara river buoys will be kept in position as late as the season will allow.

Charity Shoal buoy and all the St. Lawrence river buoys will also be left in place as late as possible.

FRANKLIN HANFORD,
Commander U. S. N., Inspector 10th L. H. Dist.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 11TH DIST.
DETROIT, MICH., Nov. 7, 1898.

About the 10th instant the U. S. light-house tender Marigold, will commence removing all iron buoys marking dangers to navigation in Lake Huron and adjacent waters.

Wooden spars painted same color, will be substituted and allowed to remain until carried away by the ice.

By order of the Light-House Board:

DUNCAN KENNEDY,
Lt. Commander, U.S.N., Inspector 11th Dist.

ADDRESS WANTED.

John Norvell, please write to Myles Maloney, 912 7th street, Port Huron, Mich. Important news. If anyone knows of Mr. Norvell's whereabouts, please advise above named. 41-45

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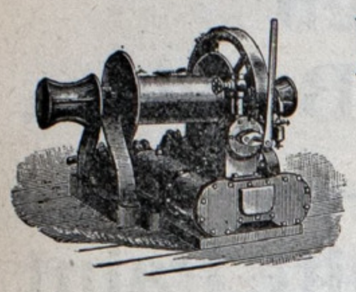

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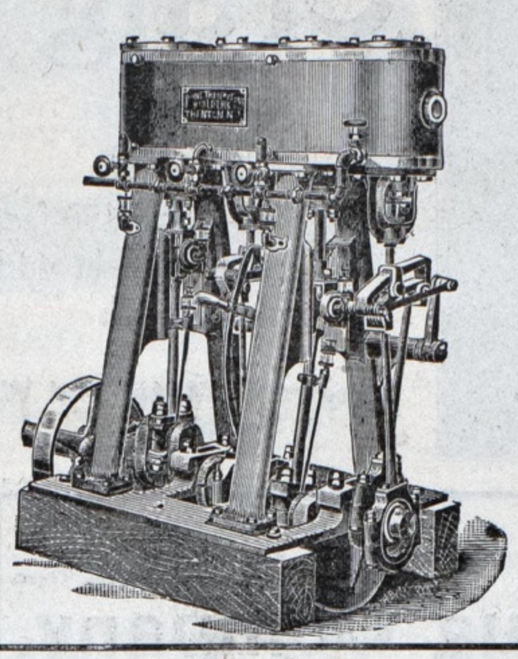

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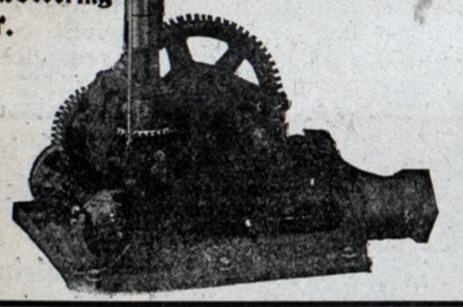

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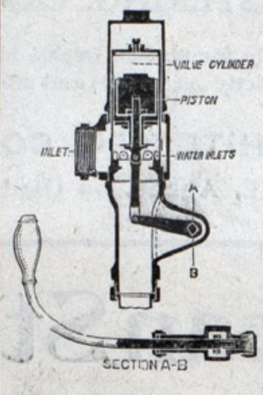

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